

Work Order ID 53653

November 11, 2009 3:03:59 PM

Page 1

Item ID: D407-667-205TRN

Accept

Revision ID: F

Item Name: Crosstube Turning Detail

Start Date: 11/11/2009 Start Qty: 1.00

Required Date: 24/11/2009 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date: 09-11-11

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D407-667-245

Rev F

100

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8531 on both ends as per Folio FA248□2-Turn first side as per Folio FA248□3- File transition lines smooth.

a.m. 09-11-30

110

0.00



QC

QC1- Inspect dimensions to dimension sheet

Memo

0.00

Quality Control

a.m. 09-11-30

120

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA248□2- File transition lines smooth.□3- Remove sand and plugs□4-Scribe part # and batch # using vibrating stylus as per Dwg D407-667-245 □Inside of Cuff(Donot engrave on outside of tube)

a.m. 09-11-30 RTO

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D407-667-20STRN PAR #: N/A Fault Category: Cross tube NCR: Yes No DQA: ld Date: 09.12.07
 Resolution: acceptable Disposition: use as is QA: N/C Closed Date: 09.12.11

NCR: <u>53653</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
09.12.03	120	THERE ARE CIRCUMFERENTIAL MACHINING MARKS ON INSIDE OF CUFF, for the plug for R.C. process	<u>CP</u> 09.12.03 per QSI 042	Acceptable, minor marks.	<u>N/A</u>	<u>S</u> 09/12/07	<u>CP</u> 09.12.03 per QSI 042	<u>S</u> 09/12/07

NOTE: Date & initial all entries

Work Order ID 53653

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Page 2

Item ID: D407-667-205TRN

Accept



Setup Start



Revision ID: F

Stop



Item Name: Crosstube Turning Detail

Start Date: 11/11/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 24/11/2009 Req'd Qty: 1.00

Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	QC1- Inspect dimensions to dimension sheet	0.00							
QC	Memo	0.00							
Quality Control									
140	QC8- Inspect parts - second check	0.00							
QC	Memo	0.00							
Quality Control									
150	Crosstubes Chemical Conversion	0.00							
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	Ensure no sand is in the tube before alodine.								

Am 09-11-30 ①

1 - - Am 9-12-1

1 - - Am 9-12-1

Work Order ID 53653

November 11, 2009 3:03:59 PM



Page 3

Item ID: D407-667-205TRN

Accept



Setup Start



Revision ID: F

Stop



Item Name: Crosstube Turning Detail

Start Date: 11/11/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 24/11/2009 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC3- Inspct Part Finish

0.00



QC

Memo

0.00

Quality Control



NB 09-12-01

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack ☐ Location: X-TUBE CELL

1 - - 09-12-01

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09/12/07

u 9.12.03

Picklist Print

November 11, 2009 3:04:04 PM

Page 1

Work Order ID: 53653

Parent Item: D407-667-205TRNRevF

Parent Item Name: Crosstube Turning Detail

Comments:

Start Date: 11/11/2009

Required Date: 24/11/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	--------------------------	---------------	----------------	--------

D6011-115RevA1

Manufactured

No

120

Each

17.0000

1.0000



Crosstube Material

0.00 09-11-30

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

17

32307

1

38344

16

DART AEROSPACE LTD		Work Order:	53053
Description: Crosstube Assembly		Part Number:	D407-667-245
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.495	/			
	1.832	+0.005/-0.000	1.837	/			
	1.838	+0.005/-0.000	1.843	/			
	1.892	+0.005/-0.000	1.897	/			
	2.052	+0.005/-0.000	2.057	/			
	2.206	+0.005/-0.000	2.211	/			
	2.521	+0.005/-0.000	2.526	/			
	2.633	+0.005/-0.000	2.638	/			
	4.10	+/-0.030	4.10	/			
	4.978	+/-0.030	4.978	/			
	2.040	+0.000/-0.010	2.040	/			
	0.125	+/-0.010	0.125	/			
	R0.063	+/-0.010	R0.063	/			
	R0.500	+/-0.010	R0.500	/			
	2.490	+0.005/-0.000	2.495	/			
SIDE B	1.832	+0.005/-0.000	1.837	/			
	1.838	+0.005/-0.000	1.843	/			
	1.892	+0.005/-0.000	1.897	/			
	2.052	+0.005/-0.000	2.057	/			
	2.206	+0.005/-0.000	2.211	/			
	2.521	+0.005/-0.000	2.526	/			
	2.633	+0.005/-0.000	2.638	/			
	4.10	+/-0.030	4.10	/			
	4.978	+/-0.030	4.978	/			
	2.040	+0.000/-0.010	2.040	/			
	0.125	+/-0.010	0.125	/			
	R0.063	+/-0.010	R0.063	/			
	R0.500	+/-0.010	R0.500	/			
	112.91	+/-0.020	112.910	/			

Measured by:	C.M.	Audited by:	IAWN	Prototype Approval:	N/A
Date:	01.11.30	Date:	9-12-01	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM	
D	07.02.19	Dwg Rev updated	KJ/JLM	
E	09.05.20	Dwg Rev updated	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

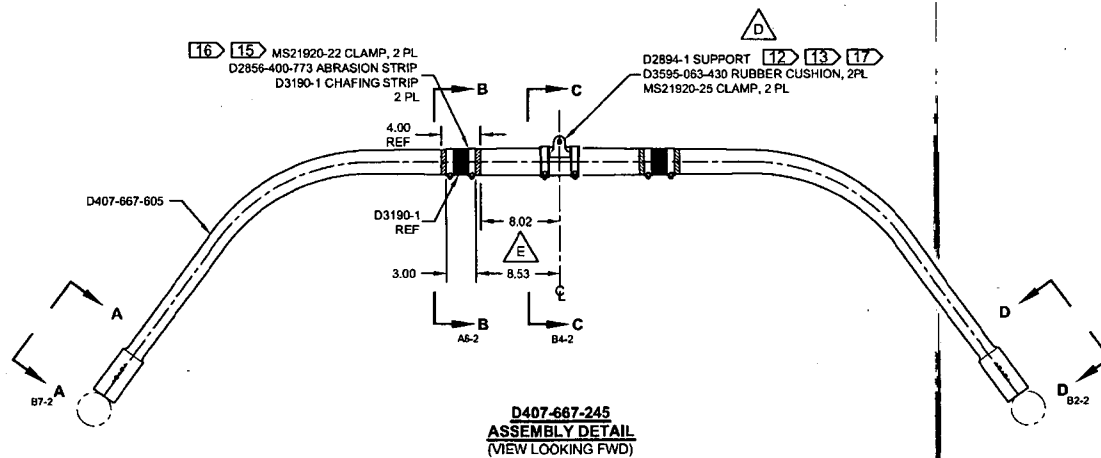
- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 53653
PH 0911-11

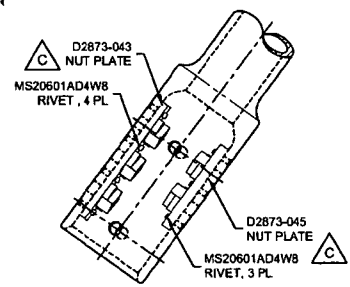
RELEASED
05/11/12

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.80 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECR#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>RF</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D407-667-245 REV: F SHEET 1 OF 4 TITLE CROSSTUBE ASS'Y (407 HIGH AFT) SCALE NTS <small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	
DRAWN	<i>RF</i>		
CHECKED	<i>RF</i>		
MFG. APPR.	<i>RF</i>		
APPROVED	<i>RF</i>		
DE APPR.	<i>RF</i>		
DATE	08.11.06		

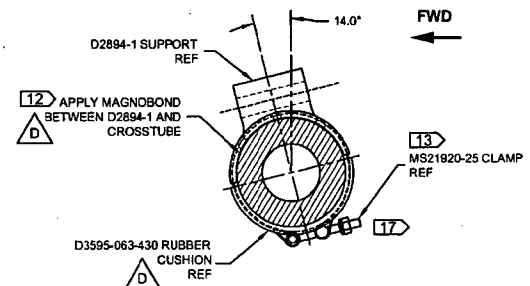
W/O 53653



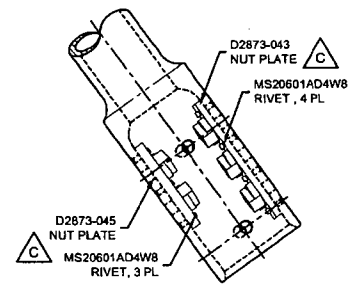
D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



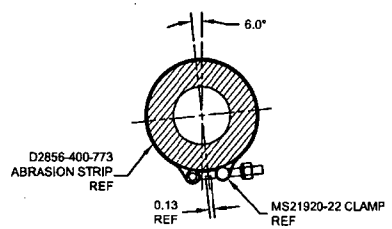
VIEW A-A CUFF DETAIL
SCALE 4X



SECTION C-C
SCALE 4X



VIEW D-D CUFF DETAIL
SCALE 4X

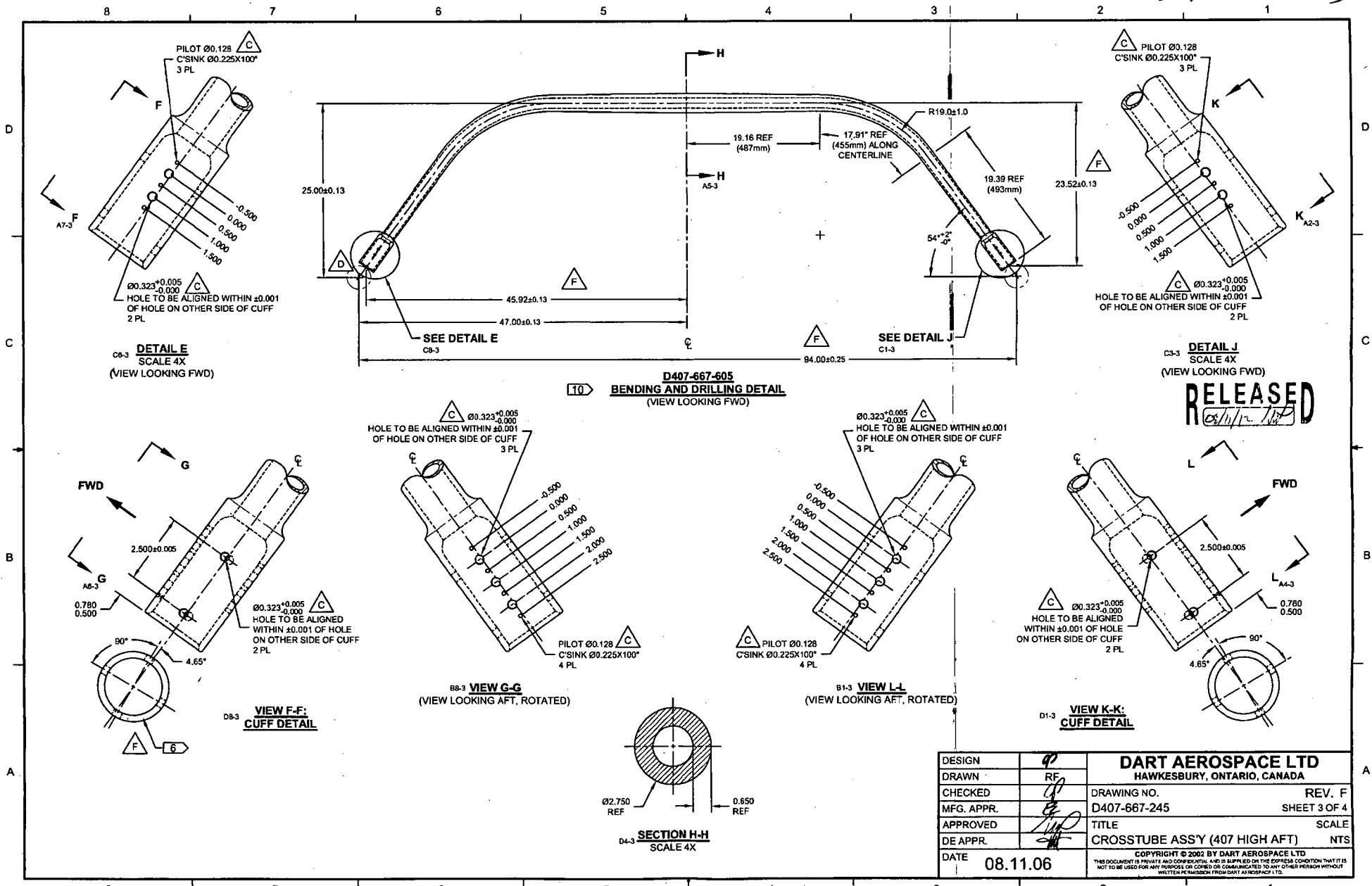


SECTION B-B
SCALE 4X, 2PL

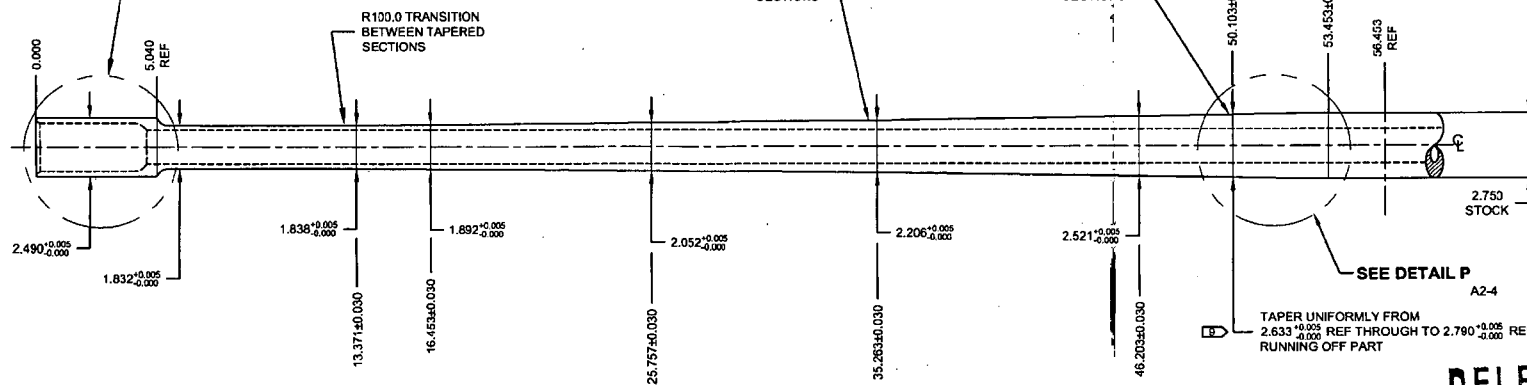
RELEASED
08/11/06

DESIGN	40	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	40	DRAWING NO.	REV. F
MFG. APPR.	40	D407-667-245	SHEET 2 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.	40	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
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W/O 53653



SEE DETAIL M
A7-4

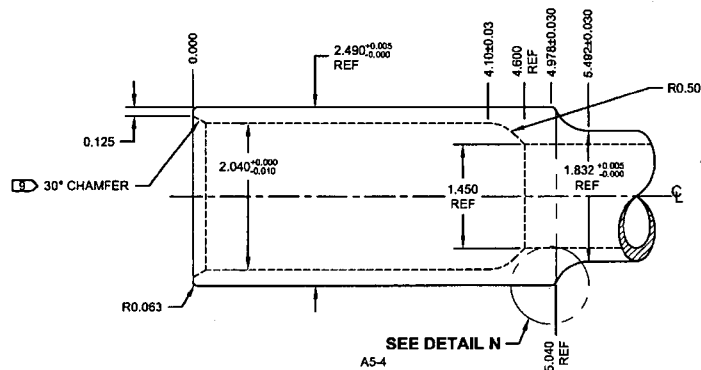


SEE DETAIL P
A2-4

TAPER UNIFORMLY FROM
2.633 (+0.005/-0.000) REF THROUGH TO 2.790 (+0.005/-0.000) REF
RUNNING OFF PART

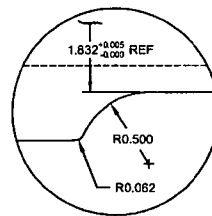
RELEASED
08/11/12

D407-667-245 MACHINING DETAIL

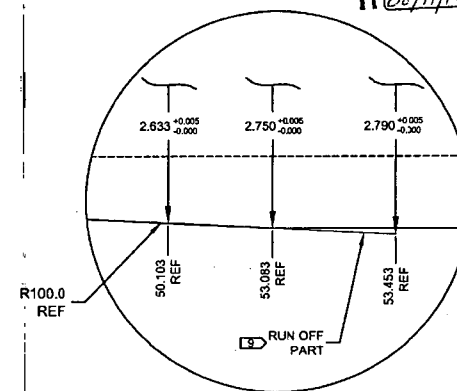


SEE DETAIL N
A5-4

DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	GP	D407-667-245	SHEET 4 OF 4
APPROVED	TH	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Chris Provencal

From: David Shepherd [dshepherd@dartaero.com]

Sent: December 3, 2009 1:12 PM

To: 'Chris Provencal'

Subject: RE: NCR D407-667-245

For the reasons you list below, I agree that this tube is acceptable.
I recommend raising a PAR to prevent this from happening again and showing it to JL.

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]

Sent: Thursday, December 03, 2009 7:41 AM

To: 'David Shepherd'

Subject: NCR D407-667-245

Qty(2) D407-667-245 xtubes. There are circumferential machining marks on the inside of the cuff. You can feel the texture with your hand. It appears to be similar to texture you can get on the outside of the tube after machining, but would normally be ground out.

I am told there is no way to grind/polish them out (no access). The dwg states that there can be no circumferential marks on the outside of the xtube. These are on the inside, and in an area of the tube that will likely only see compressive loads. Based on that I would say it's acceptable. I would guess that we've likely had varying degrees of similar marks on past tubes.

- Chris

No virus found in this incoming message.

Checked by AVG - www.avg.com

Version: 8.5.426 / Virus Database: 270.14.91/2542 - Release Date: 12/03/09 07:32:00